ECOLOGICAL RELATIONSHIPS

1.Mutualism

- **- organisms benefit from each other (symbiosis or give and take relationship)**

Bees/butterflies and flowers

Mutualism

Mutualism is a relationship in which both species benefit. It is a give and take relationship. When one species receives food in return for transporting the pollen of the other organism, which occurs between bees and flowers.

Clownfish and Coral

Ox pecker and Deer

2.Commensalism

- **- one organism is benefited while the other is neither benefited nor harmed**

Ferns or Orchids and tree

Commensalism

Commensalism is a relationship in which one organism benefits while the other is neither helped nor harmed. Examples are orchids that grow on the bark of a tree. The tree gains no benefit from the barnacle, but the orchids get shelter and space.

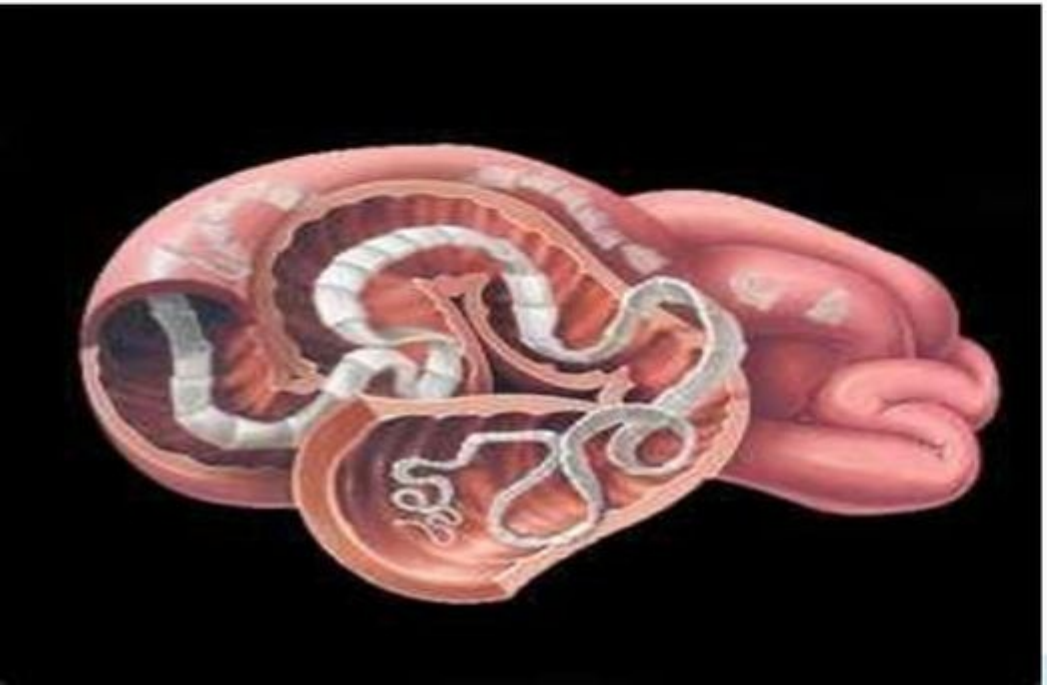
Commensal is the one that benefits from the relationship. Orchid is an example.

Small (Remora) Fish and Shark

Bird **nests in a** ***tree***

3.Parasitism

- **- one organism (the parasite) is benefited while the other(the host) is harmed**
- **Parasites: a. Ectoparasites –outside the host's body**
  (ex:lice, ticks, fleas)
  b. Endoparasites- inside the host's body
  (ex. tapeworm, ascaris)



Parasitism

Parasitism is a relationship in which one organism benefits and the other organism is harmed, but not always killed. The organism that benefits is called the parasite, and the one that is harmed is the host. Parasites can be ectoparasites -- such as mosquitoes, ticks, fleas, and leeches -- that live on the surface of the host. Parasites can also be endoparasites -- such as intestinal worms – that live inside the host.

Mosquito **is a parasite, feeding on** ***human*** **while transferring the disease called Malaria or Dengue.**

Tick or fleas **that lives on a** ***dog***

4.Predation

- **one organism (*predator*-stronger/bigger) hunts and eats the other organism (*prey* -weaker/smaller)**

Snake (Predator) and Mouse (Prey)

Predation

Predation is when one organism eats another organism for food. The organism that is eaten is called the prey. Examples of predation are snakes that eat rat, and lions that eat deer. Lions and snakes are called predator.

5.Competition

- **organisms compete for the same resources/needs in order to survive**

Elephants

Competition

Competition is when individuals or populations compete for the same resource, and can occur within or between species. When organisms compete for a resource such as food, space or territory. An example is lions and hyenas that compete for prey.

School of fish

Birds

Plants

6. Cooperation

- **- organisms of the same kind show division of labor in order to survive**

Colony of Ants ***Colony of Bees***

7.Saprophytism

- **- organisms depend on dead organisms/materials**

Fungus and Trees

Mushroom and a log

Symbiotic Relationship

Symbiosis is a type of relationship which describes two different species that live near each other and both derive benefit from the relationship. Non-symbiotic relationship means both species benefit when together, but they don't live close together and they don't depend on each other for survival. This relationship happens when two species come across each other.

One example is a bird Heron at the back of a carabao. It eats ticks and other harmful insects off the carabao. Have you ever heard the phrase, 'I'll scratch your

Non-Symbiotic Relationship

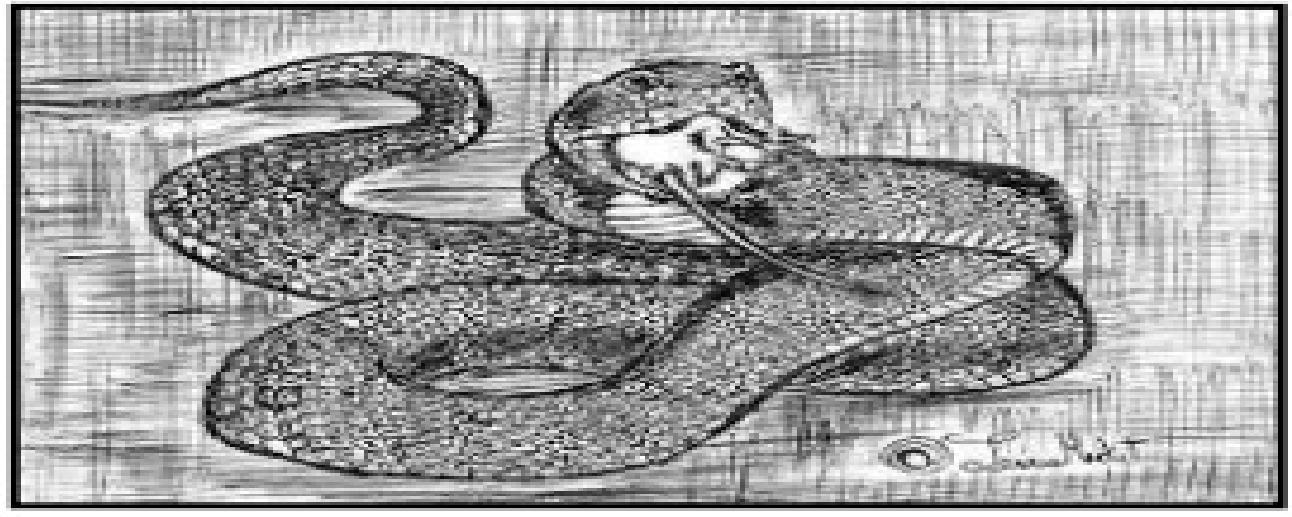
It means free living and independent. It is a type of interaction in which individuals of two different species or two population function in very close association but do not affect one another adversely and beneficially. It is also called neutralism.

ACTIVITY 1

Directions: Identify the ecological relationships that exist between these organisms in the images below. Write your answer on a separate sheet of paper.

1.

2.



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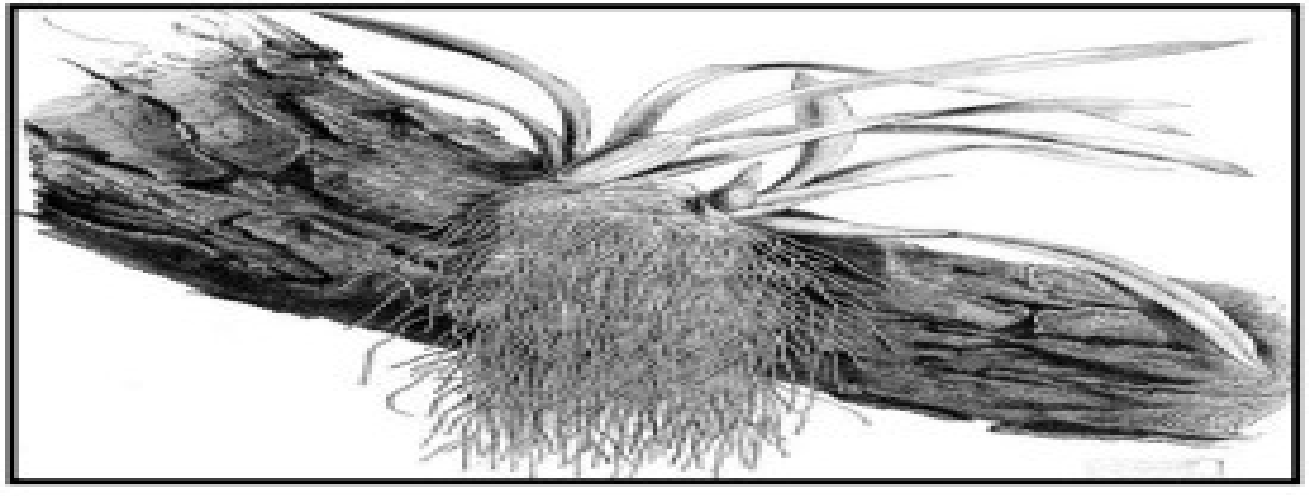

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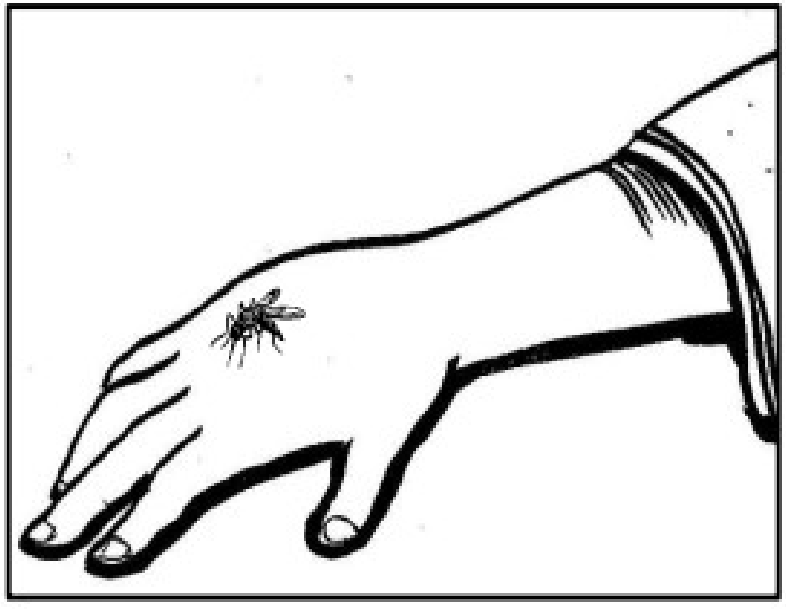


5.

ACTIVITY 2

Identify the relationship shown in each of the following situations. Write the letter of your answer.

A – Commensalism
B – Competition
C- Cooperation
D- Mutualism
E- Parasitism
F- Predation
G-Saprophytism

1. Lice on a girl's head

2. A lion eating a deer

3. Bee sucking the nectar of a gumamela

4. A moray eel eating a small fish

5. Bracket fungi on a dead trunk

6. Tapeworm inside a pig's body

7. Pond crustaceans fighting for weeds

8. Several fish feeding on a piece of bread

9. Ants gathering food for their colony

10. Spiders build their web on plants but don't harm plants

Levels of Organization in an Ecosystem

Organism, Species, Individual

An individual is any living thing or organism. Individuals do not breed with individuals from other groups. Animals, unlike plants, tend to be very definite with this term because some plants can cross-breed with other fertile plants. For example, a carabao, interacts with its environment, and will only reproduce with other carabaos just like it.

Population

A group of individuals of a given species that lives in a specific geographic area at a given time. Note that populations include individuals of the same species but may have different genetic makeup such as hair/eye/skin color and size between themselves and other populations. For example, all the horses inside the ranch or all frogs in the fishpond.

Community

This includes all the populations in a specific area at a given time. A community includes populations of organisms of different species. In the images above, the populations of carabaos, grasses and insects interact in a defined location. A great community usually includes biodiversity.

Ecosystem

Ecosystems include more than a community of living organisms (biotic) interacting with the environment (abiotic). At this level note how carabaos and insects depend on other abiotic factors such as sunlight, water, air and temperature.

Biome

A biome, in simple terms, is a set of ecosystems sharing similar characteristics with their abiotic factors adapted to their environments. Examples of biomes are tropical rainforest, temperate forest, desert, tundra, taiga, grassland, savanna and freshwater.

Biosphere

The **biosphere** is a narrow zone of the earth where land, water, air interact with each other to support life. It is in this zone that life exists. There are several species of organisms that vary in size from microbes and bacteria to large mammals. Parts of the lithosphere (solid part), hydrosphere (liquid part), and atmosphere (gaseous part) make up the biosphere.

ACTIVITY 3

Directions: Read and understand the paragraph carefully. Identify the correct words that fit in the given sentences in the box below. Write your answer on a separate sheet of paper.

Biome	Biosphere	Community	Ecosystem
	Organism	Population	

(1) _____ refers to a living thing that has an organized structure, can react to stimuli, reproduce, grow and adapt to its environment. (2) _____ is a group of organisms belonging to the same species that live in the same area and interact with one another.

(3) _____ is all of the populations of different species that live in the same area and interact with one another.

(4) _____ includes the living organisms in an area and the non-living aspects of the environment. Ecosystem is made up of the biotic and abiotic factors in an area.

(5)_____ is an area of the planet that can be classified according to the plants and animals that live in it.

(6)_____ includes most of Earth, including part of the oceans and the atmosphere.

PROJECT

RUBRICS

Objective: to create a model ecosystem

Performance Task: "Terrarium Making"

Learning Competencies

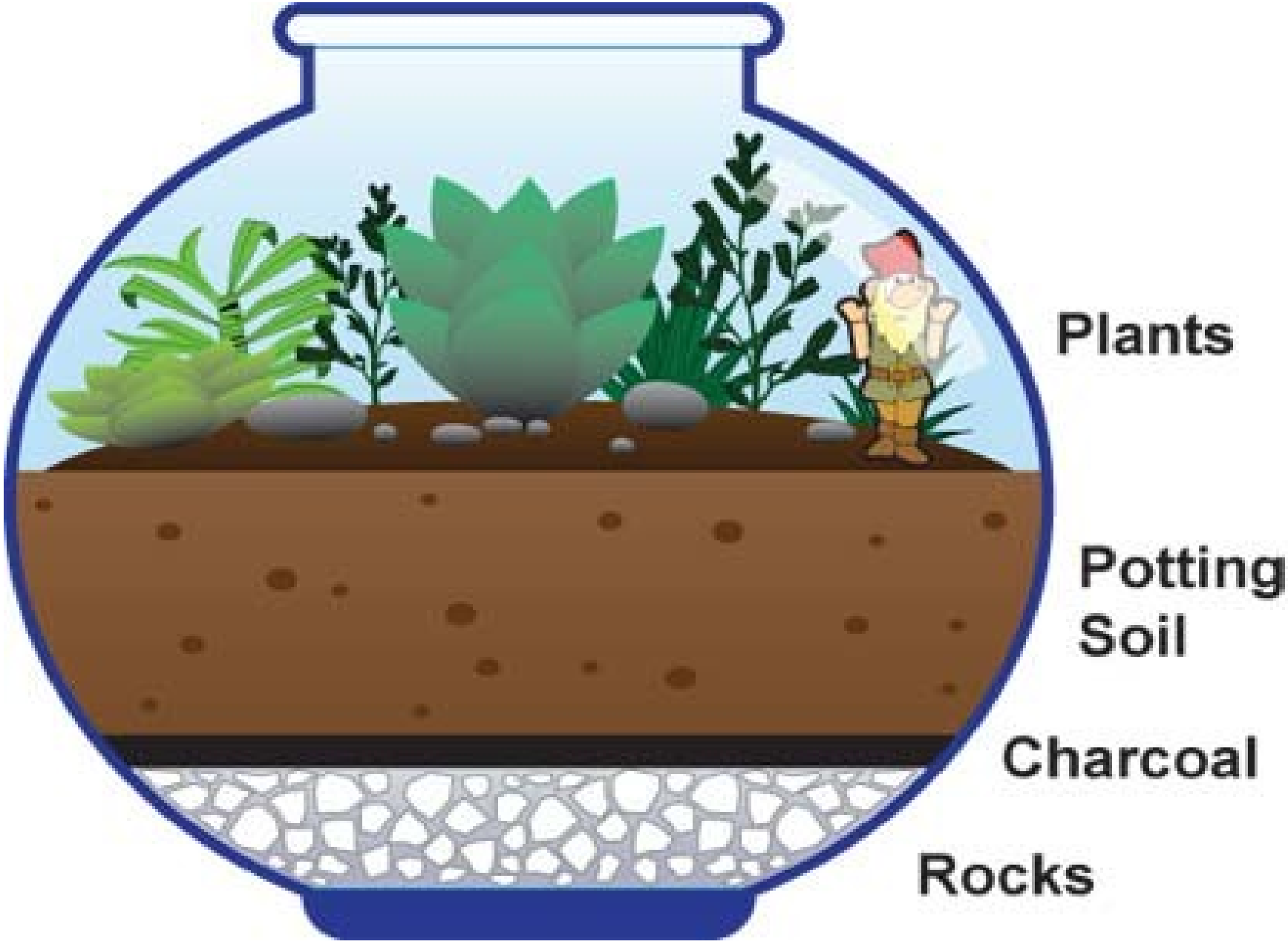
- to create a transparent container out of recycled things, in any shape using required dimensions, with design at the base and cover only
- to put living things like small plants, at least two different animals with symbiotic relationship
- to put appropriate non-living things like loam to sandy loam soil, pebbles and water
- to arrange the lay-out so that living things can thrive for weeks
- to design the terrarium in near resemblance to actual ecosystem

Assessment Plan:

- 1. Points Allotted: The completed product will be given a total of 100 points.
- 2. Assessment tool: analytic rubric

ANALYTIC RUBRIC FOR TERRARIUM

Performance Criteria	Level 1 Beginner	Level 2 Master	Level 3 Expert	Score
1. Appropriateness of Container	With correct design but not transparent incorrect dimension	Transparent and with correct design & dimension but not from recycled materials	transparent & made out of recycled things, in any shape using required dimensions, with design at the base and cover only	
2. Appropriateness of the chosen living things	Use only small plants or animals	Use small plants and small animals but with no symbiotic relationship	Use small plants & at least two small animals with symbiotic relationship	
3. Completeness of the non-living things	Use other type of soil and no water	Use loam or sandy loam soil with pebbles and no water	Use loam to sandy loam soil with pebbles and water	
4. Visual appeal	Layout and design does not resemble an ecosystem	Layout and design resemble an ecosystem w/ minimal flaws	Lay-out & design are attractive like real ecosystem	
5. Promptness of submission	Submitted two day safter the deadline	Submitted one day after the deadline	Submitted on or before the deadline	
Scoring guide: Level 3 = 20		Level 2 = 14	Level 1 = 7	Total


Plants
Potting Soil
Charcoal
Rocks

____ 1. In a predation relationship between snake and mice, what organism is the hunter?

A. Decomposer B. Mice C. Prey D. Snake

____ 2. Between a lion and a deer, which one is killed and eventually eaten by the predator?

A. Deer B. Host C. Lion D. Parasite

____ 3. Which of the following is NOT an external parasite?

A. Fleas B. Intestinal worms C. Leech D. Ticks

____ 4. Which one is hunted and eaten in a particular feeding relationship?

A. Commensal B. Decomposer C. Predator D. Prey

____ 5. What relationship describes a close interaction between two different species?

A. Competition B. Non-symbiotic C. Predation D. Symbiotic

____ 6. Which relationship that an organism benefits, while the other is unaffected?

A. Bee and flower
C. Lichens on a bark of a tree
B. Hawk and snake
D. Dogs fighting over a piece of bone

____ 7. An orchid uses a bark of a tree as a safe place to live. While living there, the tree provides space and shelter for the orchid. This is an example of what type of relationship?

A. Commensalism B. Competition C. Decomposition D. Parasitism

____ 8. A leech feeds on the blood of different organisms. This usually causes discomfort to the organism and sometimes disease and death. What relationship is being displayed between leech and the organisms?

A. Commensalism B. Competition C. Decomposition D. Parasitism

____ 9. Which relationship shows that both organisms benefit each other?

A. Intestinal worms and human B. Leech and carabao C. Bee and flower D. Tiger and deer

____ 10.During commensalism, Remora fish usually follows behind whale to pick up food scraps that they leave behind. Which one is the commensal, and why?

A. Remora fish, because it is eaten or harmed by the whale.
B. Remora fish, because it gets its food behind whale.
C. Whale, because it gets its food from Remora fish.
D. Whale, because it is affected or harmed.

_____ 11. What is the study of the relationship of plants and animals with their physical environment?

A. Biology B. Biosphere C. Ecology D. Ecosphere

_____ 12. Which of the following statements correctly describes an ecosystem?

I. It includes living and nonliving things in a particular area.

II. It is an interaction between biotic and abiotic factors.

III. It includes living things with their physical environment.

IV. It is composed of organisms only.

A. I,II,III,IV B. I,II,III only C. I,II,IV only D. II,III,IV only

_____ 13. Which best describes a pond where a frog lives?

A. Ecosystem B. Habitat C. Organism D. Population

_____ 14. Which is TRUE about the organization of an ecosystem?

A. Communities make up species, which make up populations.

B. Populations make up species, which make up communities.

C. Species make up communities, which make up populations.

D. Species make up populations, which make up communities.

_____ 15. Where does an animal lives and gets what it needs to survive?

A. Community B. Environment C. Habitat D. Niche